Cyclospora

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

This disease is caused by *Cyclospora cayetanensis*, a coccidian protozoan parasite. Humans with cyclosporiasis shed the parasite in a non-infectious form that takes from several days to a couple of weeks to mature into its infectious form. The time required for maturation to the infectious form depends on factors such as temperature and moisture.

B. Clinical Description

This parasite infects the small intestine (bowel) and typically causes watery diarrhea. Other symptoms can include nausea, vomiting, abdominal cramping, gas and bloating, fatigue and loss of appetite and weight. Occasionally, infected individuals may not have any symptoms. Untreated, symptoms may last from several days to several weeks (longer in immunocompromised individuals), and weight loss can be significant (exceeding 20 pounds in some cases).

C. Reservoirs

Humans are the only known reservoir for *Cyclospora cayetanensis*.

D. Modes of Transmission

Current knowledge of human cyclosporiasis suggests that it is *not* transmitted directly from person-to-person. After being shed in human stool, the parasite must undergo developmental changes (taking days to weeks) before becoming infectious. Humans become infected by consuming food or water that has been contaminated with human feces containing *Cyclospora*.

E. Incubation Period

The incubation period is about 1 to 2 weeks, with an average of 1 week.

F. Period of Communicability or Infectious Period

People may shed *Cyclospora* parasites for days to over one month (while actively ill). It is not known how long the parasite may be shed after symptoms have stopped.

G. Epidemiology

Cyclosporiasis was first recognized in 1979. The parasite appears to be widely distributed throughout the world with a predominant number of cases occurring during the warmer months. The largest documented outbreaks of cyclosporiasis in the United States occurred during the summers of 1996 and 1997; a majority of those cases had consumed imported raspberries.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. What to Report to the Massachusetts Department of Public Health

Report a case that meets either of the following criteria:

- Demonstration of *Cyclospora cayetanensis* oocysts in stool, duodenal/jejunal aspirates, or small bowel biopsies; or
- Demonstration of *Cyclospora cayetanensis* DNA in stool, duodenal/jejunal aspirates, or small bowel biopsies.

Note: See Section 3) C below for information on how to report a case.

B. Laboratory Testing Services Available

The Massachusetts State Laboratory Institute does not provide ova and parasite testing of clinical specimens or food samples.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify transmission sources of public health concern (*e.g.*, contaminated food or water) and to stop transmission from such sources.
- To provide education about reducing risk of infection.

B. Laboratory and Healthcare Provider Reporting Requirements

The Massachusetts Department of Public Health (MDPH) requests that laboratories report to the local board of health in the community where diagnosed all cases of cyclosporiasis (by telephone, confidential fax or in writing). Please refer to the lists of reportable diseases (at the end of this manual's introductory section) for information.

C. Local Board of Health Reporting and Follow-Up Responsibilities

1. **Reporting Requirements**

The MDPH requests that each local board of health (LBOH) report the occurrence of any case of cyclosporiasis, as defined by the reporting criteria in Section 2) A. Current recommendations are that cases be reported to the MDPH Division of Epidemiology and Immunization, Surveillance Program using an official MDPH *Bacterial and Parasitic Gastroenteritis Case Report Form* (see copy in Appendix A). Please refer to the *Local Board of Health Reporting Timeline* (at the end of this manual's introductory section) for information on prioritization and timeliness requirements of reporting and case investigation.

2. **Case Investigation**

a. It is the LBOH responsibility to complete a *Bacterial and Parasitic Gastroenteritis Case Report Form* (in Appendix A) by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the case's healthcare provider or the medical record.

b. Use the following guidelines to assist you in completing the form:
   1) Accurately record the demographic information, date of symptom onset, symptoms, and medical information.
   2) When asking about exposure history (food, travel, activities, etc.), use the incubation period range for cyclosporiasis (1−14 days). Specifically, focus on the period beginning a minimum of 1 day prior to the case's onset date back to no more than 14 days before onset.
   3) If possible, record any restaurants at which the case ate, including food item(s) and date consumed. If you suspect that the case became infected through food, use of the MDPH *Foodborne Illness Complaint Worksheet* (located in Appendix A) will facilitate recording additional information. It is requested that LBOHs fax or mail this worksheet to the MDPH Division of Food and Drugs (see top of worksheet for fax number and address). This information is entered into a database, and will help link other complaints from neighboring towns, thus helping to identify a foodborne illness outbreak. *This worksheet does not replace the Bacterial and Parasitic Gastroenteritis Case Report Form*.
   4) Ask questions about travel history and outdoor activities to help identify where the case became infected.
   5) Ask questions about water supply because cyclosporiasis may be acquired through water consumption.

6) Household/close contact, pet or other animal contact, daycare, and foodhandler questions are designed to examine the case's risk of having acquired the illness from or potential for transmitting it to these contacts. Determine whether the case attends or works at a daycare facility and/or is a food handler. As noted in Section 1) D, current knowledge of cyclosporiasis suggests that it is not transmitted directly from person-to-person.
7) If you have made several attempts to obtain case information, but have been unsuccessful (*e.g.*, the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the case report form with as much information as you have gathered. Please note on the form the reason why it could not be filled out completely.

c. After completing the case report form, attach lab report(s) and mail (in an envelope marked "Confidential") to the MDPH Division of Epidemiology and Immunization, Surveillance Program. The mailing address is:

MDPH, Division of Epidemiology and Immunization
Surveillance Program, Room 241
305 South Street
Jamaica Plain, MA 02130

d. Institution of disease control measures is an integral part of case investigation. It is the LBOH responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4), Controlling Further Spread.

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (*105 CMR 300.200*)

Since cyclosporiasis is not yet reportable by regulation in Massachusetts, no isolation and quarantine requirements currently exist under *105 CMR 300.200*. However, the following guidelines are recommended.

Minimum Period of Isolation of Patient

Foodhandlers with confirmed *Cyclospora* infection should be excluded from work. After diarrhea has resolved, foodhandlers may only return to work after producing one negative stool specimen. In outbreak circumstances, a second consecutive negative stool specimen will be required prior to returning to work.

Minimum Period of Isolation of Contacts

Contacts with diarrhea who are foodhandlers shall be considered the same as a case and handled in the same fashion. No restrictions otherwise.

Note: A foodhandler is any person directly handling or preparing food. See glossary for a more complete definition.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare and School

As noted in Section 1) D of this chapter, current knowledge of human cyclosporiasis suggests that it is *not* transmitted directly from person-to-person. After being shed in human stool, the parasite must undergo developmental changes (taking days to weeks) before becoming infectious. Humans become infected by consuming food or water that has been contaminated with human feces containing *Cyclospora*. There are no specific recommendations for daycare or school situations as found in the other enteric disease chapters (*e.g.*,

salmonellosis, shigellosis, etc.). See next section if there is a cluster of cases identified at a school or daycare that may be associated with a contaminated food item.

Reported Incidence Is Higher than Usual/Outbreak Suspected
If the number of reported cases of cyclosporiasis in your city/town is higher than usual, or if you suspect an outbreak, investigate to determine the source of infection and mode of transmission. A common vehicle, such as water or food, should be sought and applicable preventive or control measures should be instituted (*e.g.*, removing an implicated food item from the environment). Consult with the epidemiologist on-call at the Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850**.** The Division can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several town lines and therefore be difficult to identify at a local level.

Note: Refer to the MDPH's *Foodborne Illness Investigation and Control Reference Manual* for comprehensive information on investigating foodborne illness complaints and outbreaks. (Copies of this manual were distributed to local boards of health in 1997–98. It can also be located on the MDPH website in PDF format at <http://www.magnet.state.ma.us/dph/fpp/refman.htm>.) For recent changes (fall of 2000) to the Massachusetts Food Code, contact the Division of Food and Drugs, Food Protection Program at (617) 983-6712 or through the MDPH website at <http://www.state.ma.us/dph/fpp/>.

D. Preventive Measures

Personal Preventive Measures/Education
To avoid infection with *Cyclospora*, recommend that individuals:

- Avoid drinking unboiled or untreated water when hiking, traveling in developing countries or wherever the water quality is unknown. Bringing water to a full, rolling boil is sufficient to kill *Cyclospora*.
- Thoroughly wash all fresh fruits and vegetables prior to consumption.

A *Cyclospora Public Health Fact Sheet* can be obtained from the Division of Epidemiology and Immunization or through the MDPH website at <http://www.state.ma.us/dph/>. Click on the "Publications" link and scroll down to the Fact Sheets section.

ADDITIONAL INFORMATION

The formal Centers for Disease Control and Prevention (CDC) surveillance case definition for *Cyclospora* is the same as the criteria outlined in Section 2) A of this chapter. (CDC case definitions are used by the state health department and CDC to maintain uniform standards for national reporting.) When reporting a case to the MDPH, always refer to the reporting criteria in Section 2) A.

REFERENCES

American Academy of Pediatrics. *1997 Red Book: Report of the Committee on Infectious Diseases, 24th Edition.* Illinois, Academy of Pediatrics, 1997.

CDC. Case Definitions for Infectious Conditions Under Public Health Surveillance. *MMWR.* 1997; 46: RR-10.

CDC. *Cyclospora: Information for Health Care Providers. Fact Sheet Document cyhcp-1, wpd.* CDC, April 17, 1997.

CDC Website. *Cyclospora* Infection. Available at <www.cdc.gov/ncidod/diseases/cyclospo/cyclogen.htm>. Updated June 21, 1999.

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Soave, Rosemary. Cyclospora: An Overview. *Clinical Infectious Diseases,* 1996; 23:429-37.